

a) Amendments to Claims

As of the office action of April 21, 2006, claims 3, 5, and 22-25 were pending. In this response, claims 3, 5, and 25 are amended. As of this response, claims 3, 5, and 22-25 are pending.

1.-2. (Canceled).

3. (Currently Amended) The process according to claim 25 in which the enzyme is one in which at least amino acid 47 and/or 51 of P450_{BM-3}[[,]] ~~or amino acid 96 of P450_{eam}[[,]]~~ have been changed to an amino acid with a less polar side-chain.

4. (Canceled).

5. (Currently Amended) The process according to claim 25 in which the ~~enzyme is (i) a P450_{eam} mutant enzyme and comprises at least one or more of the following mutations: F87W, F87I, F87L, T185L, T185F, V247A or V247L; (ii) a P450_{eam} mutant enzyme and comprises at least both the mutations F87A and I395F; or (iii) a P450_{BM-3} mutant enzyme and comprises at least both the ~~mutation~~ mutations R47L and Y51F.~~

6.-21. (Canceled).

22. (Previously Presented) The process according to claim 25 in which the substrate is selected from the group consisting of limonene, pinene, and substituted derivatives thereof.

23. (Previously Presented) The process according to claim 25 in which the substrate is a cyclic sesquiterpene, or a substituted derivative thereof.

24. (Previously Presented) The process according to claim 23 in which the substrate is selected from the group consisting of aromadendrene, carophyllene, longifolene, valencene, isobazzanene, silphinene, ishwarane, isopatchchoul-3-ene, isosesquicarene, and substituted derivatives thereof.

25. (Currently Amended) A process for oxidising a substrate wherein said substrate is a limonene or pinene or a cyclic sesquiterpene, wherein said limonene, pinene or cyclic sesquiterpene is optionally substituted by or a substituted derivative thereof, wherein the substituent is an alkyl of 1 to 6 carbons or an alkenyl of 1 to 6 carbons, and wherein the process comprises: oxidising said substrate with a mutant haem-containing enzyme, wherein the enzyme is a P450_{BM-3} mutant enzyme of SEQ ID NO:24 that only has mutations at one or more of the following amino acid positions: 42, 47, 51, 87, 181, 263, 264 and 354 and wherein the P450_{BM-3} mutant enzyme has a higher oxidation activity towards the substrate which is being oxidised than an enzyme having the sequence SEQ ID NO:24, and wherein at least one of said mutations is a substitution of an amino acid by an amino acid with a less polar side-chain.

~~wherein when the substrate is a limonene or a pinene or substituted derivative thereof, the enzyme is selected from the group consisting of:~~

- ~~(a) a P450_{cam} mutant enzyme of SEQ ID NO:1, comprising a mutation of at least two or more of the following amino acid positions: 87, 96, 244, 247, or 248, wherein the P450_{cam} mutant enzyme has a higher oxidation activity towards the substrate which is being oxidised than an enzyme having the sequence SEQ ID NO:1, and wherein at least one of said mutations is a substitution of an amino acid by an amino acid with a less polar side chain;~~
- ~~(b) a P450_{BM-3} mutant enzyme of SEQ ID NO:24, comprising a mutation of at least one or more of the following amino acid positions: 47, 51, or 87, wherein the P450_{BM-3} mutant enzyme has a higher oxidation activity towards the substrate which is being oxidised than an enzyme having the sequence SEQ ID NO:24, and wherein at least one of said mutations is a substitution of an amino acid by an amino acid with a less polar side chain;~~

~~and wherein when the substrate is a cyclic sesquiterpene or substituted derivative thereof, the enzyme is selected from the group consisting of:~~

~~(c) a P450_{cam} mutant enzyme of SEQ ID NO:1 comprising a mutation of at least two or more of the following amino acid positions: 87, 96, or 244, wherein the P450_{cam} mutant enzyme has a higher oxidation activity towards the substrate which is being oxidised than an enzyme having the sequence SEQ ID NO:2, and wherein at least one of said mutations is a substitution of an amino acid by an amino acid with a less polar side chain;~~

~~(d) a P450_{BM-3} mutant enzyme of SEQ ID NO:24, comprising a mutation of at least one or more of the following amino acid positions: 47, 51, or 87, wherein the P450_{BM-3} mutant enzyme has a higher oxidation activity towards the substrate which is being oxidised than an enzyme having the sequence SEQ ID NO:24, and wherein at least one of said mutations is a substitution of an amino acid by an amino acid with a less polar side chain.~~